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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,262	07/24/2001	Roger L. Schultz	2000-IP-000069	4140

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EXAMINER

WAKS, JOSEPH

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/912,262

Applicant(s)

SCHULTZ ET AL.

Examiner

Joseph Waks

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23, 25, 37, 50-65, 68-75, 80-82, 86-99, 101, 103-106, and 109-123 is/are rejected.
- 7) ☒ Claim(s) 24, 26-36, 38-49, 66, 67, 76-79, 83-85, 100, 102, 107 and 108 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,5. 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the tubular membrane as recited in claims 111 and 117, the membrane surrounded by the piezoelectric material as recited in claims 115 and 123, the membrane having fluid flowing there through as recited in claim 118, and the cavity surrounding the membrane as recited in claim 122 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the fluid chamber as recited in claim 50.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 50-73, 111, 115, 117, 118, 122 and 123** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the

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application was filed, had possession of the claimed invention. The fluid chamber, the tubular membrane and the membrane surrounded by the piezoelectric material, the membrane having fluid flowing there through and the membrane surrounded by the cavity are not clearly described and identified in the specification and drawings.

5. **Claims 50-73, 111, 115, 117, 118 and 123** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. For the reasons indicated above one skilled in the art would not be able to make and/or use the invention.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1-8, 14-19, 50, 51, 53, 54, 57, 62, 64, 65, 68-70, 74, 75, 80-82, 86-99, 101, and 103-106** are rejected under 35 U.S.C. 102(b) as being anticipated by **Russel et al. (US 3,970,877)**.

Russel et al. disclose invention as claimed: an electric power generator comprising a tubular fluid conduit connectable in a tubular string (Re sketch), and a piezoelectric material 10 producing electricity in response to pressure fluctuations in the conduit caused by the fluid flow and attached to the external surface of the fluid conduit.

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Re claim 6, the feature of the reduced thickness portion is inherent to the Russel et al's disclosed structure.

Re claims 14-19, 81, 82 and 94, **Russel et al.** disclose the structure for producing the electric power as claimed. Claims 14, 15, 18, 19, 81, 86-97 and 104 that merely recite connecting and using the disclosed features together are inherent to the disclosed structure.

8. **Claims 1-3, 8** are rejected under 35 U.S.C. 102(b) as being anticipated by **Kolm et al.** (US 4,467,236).

Kolm et al. disclose in Figure 3 invention as claimed: an electric power generator comprising a tubular fluid conduit 60, and a piezoelectric material 10 producing electricity in response to pressure fluctuations in the conduit caused by the fluid flow.

9. **Claims 1-4, 7, 8, 14, 15, 18 and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by **Tubel et al.** (US 5,839,508).

Tubel et al. disclose in Figures 5 and 11 invention as claimed: an electric power generator comprising a tubular fluid conduit 24 or 22 (as shown in Figure 11) connectable in a tubular string 22, and a piezoelectric material 90 producing electricity in response to pressure fluctuations in the conduit caused by the fluid flow and attached to the external surface of the fluid conduit (Re Figure 11).

Re claims 14, 15, 18 and 19, **Tubel et al.** disclose the structure for producing the electric power as claimed. Claim 14, 15, 18 and 19 that merely recite connecting and using the disclosed features together are inherent to the disclosed structure.

10. **Claims 23, 25, 37, 62, 63, 109, 110, 112-114, 116, and 119-121** are rejected under 35 U.S.C. 102(b) as being anticipated by **Kunkel** (US 5,554,922).

Kunkel discloses in Figure 1 invention as claimed: an electrical power generator comprising an outer housing 1, a mass 7 reciprocally disposed relative to the housing, a piezoelectric material 6, a bias member 3, wherein pressure fluctuations in the housing causing the mass to displace and thereby inducing strain in the piezoelectric material.

Re claim 37, **Kunkel** discloses the structure for producing the electric power as claimed. Claim 37 that merely recites connecting and using the disclosed features together is inherent to the disclosed structure.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 9-11, 20-22, 59-61, 71-73** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Russel et al. (US 3,970,877)** or **Tubel et al. (US 5,839,508)** in view of **Klatt (US 4,669,068)**.

Both, **Russel et al.** and **Tubel et al.** disclose the generator essentially as claimed. However, neither **Russel et al.** nor **Tubel et al.** disclose the fluid conduit being helically shaped.

Klatt discloses in Figures 1 and 2 an electric power generator provided with a drill string and having a helically shaped fluid conduit 2 for the purpose of improving the generator adapted for low frequencies by absorbing the extra length required for the piezoelectric converter 10.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the generator as taught by **Russel et al.** or **Tubel et al.** and to

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provide the helically shaped fluid conduit as taught by **Klatt** for the purpose of improving the generator that is adapted for low frequencies by absorbing the extra length required for the piezoelectric converter using the helical configuration.

13. **Claims 12 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Russel et al.** (US 3,970,877) or **Kolm et al.** (US 4,467,236) or **Tubel et al.** (US 5,839,508).

Russel et al., **Kolm et al.** and **Tubel et al.**, all disclose the claimed invention except for the conduit made of titanium or of a composite material. It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the generator with the conduit made of titanium or composite material for the purpose of meeting the particular working conditions like, temperatures, vibrations or corrosive environment, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

14. **Claims 111 and 117** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kunkel** (US 5,554,922).

Kunkel discloses the claimed invention except for generally tubular membrane. It would have been an obvious matter of design choice to provide the tubular membrane for the purpose of increasing the membrane displacement, since applicant has not disclosed that the tubular membrane solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with a flat membrane.

Allowable Subject Matter

15. **Claims 24, 26-36, 38-49, 66, 67, 76-79, 83-85, 100, 102, 107, 108,** and are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claim 24, the feature of the structure including a mass and a piezoelectric material and the vibrating step comprising biasing the mass against the material to induce strain in the material wherein the pressure fluctuations are due to fluid flowing through the housing, in combination with the other limitations present, are either disclosed or taught by the prior art of record.

Re claim 26, 27 and 38-40, the feature of the generator including the bias member and the piezoelectric material disposed in the chamber formed between the fluid conduit and the outer housing, in combination with the other limitations present, are either disclosed or taught by the prior art of record.

Re claims 34-36 and 47-49, the feature of the fluid flowing through the outer housing also flows through the fluid conduit disposed within the outer housing, in combination with the other limitations present, are either disclosed or taught by the prior art of record.

Re claims 28-33, and 41-46 the feature of the fluid conduit disposed within the housing and introducing turbulence in the fluid flow through the conduit, in combination with the other limitations present, are either disclosed or taught by the prior art of record.

Re claims 66 and 67, the feature of the piezoelectric material attached to the piston bounding a portion of the fluid chamber, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

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Re claims 76-79 83-85, 100, 102, 107 and 108, the feature of the piezoelectric material supporting the member extending into the flow passage, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

Prior Art

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Waks whose telephone number is (703) 308-1676. The examiner can normally be reached on Monday through Thursday 8 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.


JOSEPH WAKS
PRIMARY PATENT EXAMINER
TC-2800

JW
September 30, 2002

